HOW TO SAMPLE FOR NEMATODES

Richard F. Davis, Extension Nematologist

I. WHY SAMPLE: Nematodes can parasitize virtually all crops and ornamental plants and can cause significant economic damage by reducing both yield and quality. Properly taken samples from small field units can reduce production costs by allowing the grower to eliminate nematode control practices where they are not needed and implement control practices where they are needed. Improper sampling or handling of samples can lead to poor recommendations and economic losses which could have been avoided.

II. WHEN TO SAMPLE: The timing of collection of nematode samples is important because nematode populations fluctuate throughout the year. Nematodes may be undetectable during the winter and early spring but increase to very high levels before harvest; following harvest, population levels may decline precipitously. Sampling when population densities are high decreases the risk of failing to detect a damaging species. The best time to collect samples is when living roots are present and nematode populations are high. For most crops, this is generally near harvest.

The optimum time to take samples for nematode assay from various Georgia crops are given below:

CROP	**WHEN TO SAMPLE**	**COMMON NEMATODES**
Cotton	October, November	Root-Knot, Lance, Reniform
Fruit Orchards (except peaches)	September, October	Root-Knot
Peaches	September, October(for root-knot); February, March, April (for ring)	Root-Knot, Ring
Peanuts	September, October	Root-Knot
Soybeans	September (group IV); October (groups V, VI); November (group VII)	Root-Knot, Lance, Reniform, Soybean Cyst
Tobacco	July	Root-Knot
Turfgrass- warm season; cool season	June, July, August; September, October, April	Root-Knot, Lance, Sting, Ring
Vegetables	August, September	Root-Knot

From roughly December through March, most Georgia soils are too cold to support active root growth of warm-season crops and nematode populations exist primarily as eggs. Unfortunately, typical laboratory assays do not detect nematode eggs, so samples collected in the winter frequently fail to detect nematodes when there are actually many nematode eggs present. Failure to detect a species does not necessarily mean that it is not present because the species may be present at low levels that the random sample missed or it may be present only as eggs which the assay cannot detect. Because of these limitations, samples should not be collected during the winter. Soil moisture should be about right for good seed germination when nematode samples are taken.

III. HOW TO SAMPLE: It is very important that the soil sample be truly representative of the area sampled. The only way to ensure this is to collect the sample from many spots around the field rather than from only one or two spots. Even if a small problem area is being sampled, soil should still be collected from multiple spots within the area being sampled. Ideally, one soil sample should be taken for every four to five acres, but practically, one sample may have to represent a much larger area of a field. The sample may represent a section that has homogeneous soil type and conditions and is farmed uniformly. The shape of a field may influence the number of acres that a sample represents. If a very large area is sampled, high-population areas will be diluted by low-population areas so that areas with nematode problems will be more difficult to identify.

Take 20-30 soil cores from random locations throughout a 4-5 acre section of the field. If a problem area is being sampled, collect soil from the margin of the affected area. Collect soil to a depth of 8 inches (20 cm) in the root zone of living plants. Sampling depth may be different with certain crops, such as turf. Thoroughly mix the collected soil and put about 1 pint of soil into a plastic bag. Do not take samples from extremely dry soil. DO NOT ALLOW SAMPLES TO GET HOT OR DRY! Storing samples in an insulated cooler protects them well. Allowing samples to sit in direct sunlight or in a hot vehicle for even a short time can kill the nematodes in the sample. Nematodes must be alive for the extraction procedure to work. Killing the nematodes in the sample may result in failure to detect nematodes when they are actually present. Send samples early in the week so that they do not spend the weekend in transit.

IV. SHIPPING SOIL SAMPLES FOR NEMATODE ASSAY: All samples for nematode assay must be submitted through your local county Extension office. Your county Extension office will send the samples to the Extension Nematology Laboratory. The results of the assay will be returned to you through your county Extension office.

V. SUMMARY OF HOW TO COLLECT AND SUBMIT A SOIL SAMPLE FOR A NEMATODE ASSAY

1. Collect a soil sample for nematode assay.

    A. Take 20-30 soil cores from random locations throughout a 4-5 acre section of the field. If a problem area is being sampled, collect soil from the margin of the affected area.

B. Collect soil to a depth of 8 inches (20 cm) in the root zone of living plants. Sampling depth may be different with certain crops, such as turf.

C. Thoroughly mix the collected soil and put about 1 pint of soil into a plastic bag. Seal tightly.

D. Keep samples cool. Do not allow samples to dry out.

2. Fill out a "NEMATODE ASSAY FORM" for each sample. Supply all information requested. You MUST list present, past, and future crop to assist in identifying nematode problems and making management recommendations. Also list variety grown. Variety information is critical for soybeans and tobacco.

3. Carefully label plastic bags on the outside with a permanent marker.

4. Your county Extension office will send the sample to the Extension Nematology Laboratory in Athens. The results of the assay and recommendations will be returned to you through your county Extension office. Keep a record of which nematodes are found in which fields.

As of October 1, 1996 the Extension Nematology Lab has started assessing the following charges:

$15.00 All routine nematode samples submitted from out of state.

$15.00 All routine nematode samples not submitted through the County Extension Office of sample origin.

$15.00 Nematode speciation (Phast or greenhouse grow-out) should be coordinated with the County Extension Agent through the Plant Pathology Specialist for that crop.